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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/797,579

03/11/2004

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EXAMINER

TADESSE, YEWEBDAR T

ART UNIT

PAPER NUMBER

1734

MAIL DATE

DELIVERY MODE

08/30/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/797,579

Applicant(s)

LEE ET AL.

Examiner

Yewebdar T. Tadesse

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-2, 6-7 and 9-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2, 6-7 and 9-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 06/06/07.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. 20070806.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION


1. In view of the Appeal Brief filed on 06/08/2007, PROSECUTION IS HEREBY REOPENED. The action is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:


PHILIP TUCKER
PRIMARY EXAMINER
SPE ART UNIT 1734

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

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only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-2, 6-7, 9-13 are rejected under 35 U.S.C. 102(e) as being anticipated by (JP 2-137029).

With respect to claims 2 and 6-7, JP'029 discloses (see Figs 1-3 and English translated Claim) a spin coating apparatus for coating photoresist, comprising: a spin chuck (chuck 3) comprising a mount part (stage 5), for mounting a wafer thereon, and an extended projection part (see Fig 2) for facilitating formation of an edge-bead thereon; a nozzle (c) for depositing photoresist onto a wafer mounted on the mount part of the spin chuck and a gas exhaust part (d) disposed so that gas is exhausted from an edge of the wafer in a turning direction of the wafer and a centrifugal direction upon rotation of the wafer; wherein the extended projection part of the spin chuck is capable of having a height lower than of the wafer mounted on the mount part (depending the thickness of the substrate).

Regarding claims 1 and 10, in JP'029 the extended projection part (see Fig 2) of the spin chuck surrounds the entire circumference of the wafer while being in contact with the circumference of the wafer mounted on the mount part.

As to claim 9, in JP'029 (see Figs 1-2) the extended projection part of the spin chuck is physically attached to the mount part (stage 5) of the spin chuck.

With respect to claim 11, JP'029 discloses (see Figs 1-3 and English translated Claim) a spin coating apparatus for coating photoresist, comprising: a spin chuck (chuck 3) comprising a mount part (stage 5), for mounting a wafer thereon, and an extended projection part (see Fig 2) for facilitating formation of an edge-bead thereon; a nozzle (c)

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for depositing photoresist onto a wafer mounted on the mount part of the spin chuck, wherein the spin chuck further comprises a separation part for separating the wafer from the spin chuck; and wherein the separation part (see Fig 1) comprises removable plugs (h) that are inserted through corresponding holes (7) in the spin chuck to push against the bottom of the wafer and separate the wafer from the spin chuck.

As to claims 12-13, in JP'029 the gas exhaust (d) is disposed above the wafer, and the gas is capable of removing edge-bead.

4. Claims 1-2, 9-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Konishi et al (US 6,012,858).

With respect to claim 2, Konishi discloses (see Figs 6 and 8) a spin coating apparatus for coating photoresist, comprising: a spin chuck (chuck 2 with tray 30) comprising a mount part (see holder 10 and flange 33), for mounting a wafer thereon, and an extended projection part (portion 32) for facilitating formation of an edge-bead thereon; and a nozzle (40) for depositing photoresist onto a wafer mounted on the mount part of the spin chuck; wherein the extended projection part of the spin chuck is capable of having a height lower than of the wafer mounted on the mount part (see column 6, lines 9-10).

Regarding claims 1 and 10, in Konishi the extended projection part (32) of the spin chuck surrounds the entire circumference of the wafer (see Fig 8) while being in contact with the circumference of the wafer mounted on the mount part.

As to claim 9, in Konishi (see Fig 3) the extended projection part of the spin chuck is physically attached to the mount part (flange 33) of the spin chuck.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-2 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelly et al (US 5,294,257) in view of Chu (US 5,857,127).

As to claims 1-2 and 10, Kelly discloses (see Figs 1A and 3B and column 3, lines 19) a spin coating apparatus for coating photoresist, comprising: a spin chuck (13) comprising a mount part (part of item 13), for mounting a wafer thereon, and an extended projection part (a firm elastomeric ring 17, 41) for facilitating formation of an edge-bead thereon; wherein the extended projection part of the spin chuck surrounds the entire circumference of the wafer (see Fig 1A) while be in contact with the

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circumference of the wafer mounted on the mount part and wherein the extended projection part of the spin chuck is capable of having a height lower than of the wafer mounted on the mount part (depending the thickness of the substrate and the elasticity of the ring 17, 41). Kelly lacks teaching a nozzle for depositing photoresist, although application of resist in conventional manner is taught in Kelly (see column 5, lines 65-66). Chu discloses a nozzle (15) for depositing photoresist onto a wafer mounted on the mount part of the spin chuck. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a nozzle in Kelly et al to apply the coating material onto the substrate.

As to claim 9, in Kelly et al (see Fig 1A) the extended projection part of the spin chuck is physically attached to the mount part of the spin chuck .

8. Claims 6-7 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konishi et al (US 6,012,858) as applied to claim 1 above and further in view of Emami et al (US 2003/0070695).

Konishi et al are cited for the same reasons described above (re claim 7). However, Konishi lacks teaching a gas exhaust disposed so that gas is exhausted from an edge of the wafer in turning direction of the wafer and a centrifugal direction upon rotation of the wafer. Emami discloses (see Fig 4) a gas exhaust disposed above the wafer so that gas is exhausted from an edge of the wafer in turning direction of the wafer and a centrifugal direction upon rotation of the wafer. It would have been obvious

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to one of ordinary skill in the art at the time the invention was made to include a gas exhaust as claimed in Chu or Konishi et al to remove the edge bead (see Abstract).

9. Claims 6-7 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelly et al (US 5,294,257) in view of Chu (US 5,857,127) as applied to claim 1 and further in view of Emami et al (US 2003/0070695).

Kelly et al is cited for the same reasons described above (re claim 7). However, Kelly et al lacks teaching a nozzle for depositing photoresist and a gas exhaust disposed so that gas is exhausted from an edge of the wafer in turning direction of the wafer and a centrifugal direction upon rotation of the wafer. Emami discloses (see Fig 4) a gas exhaust disposed above the wafer so that gas is exhausted from an edge of the wafer in turning direction of the wafer and a centrifugal direction upon rotation of the wafer. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a gas exhaust as claimed in Kelly et al to remove the edge bead (see Abstract). As to a nozzle, Chu discloses a nozzle (15) for depositing photoresist onto a wafer mounted on the mount part of the spin chuck. It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a nozzle in Kelly et al to apply the coating material onto the substrate.

Response to Arguments

10. Applicants' arguments filed with an Appeal Brief on 06/08/2007 have been fully considered but they are not fully persuasive. In addition to the newly cited art (JP'029)

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examiner maintains the 102 and 103 rejection over Konishi and Kelly alone and/or in view of others of claims 1-2, 6-10 and 12-13 for the following reasons: Examiner withdraws rejection of claim 11 over Konishi and Kelly alone and/or in view of others. Applicants argue (see Argument VII, pages 9-10, under heading Independent claim 2) that Konishi's tray section 30 cannot correspond to the recited spin chuck because tray section does not spin. First, applicants' claim 2 is not limited to a spin chuck for rotating wafer. Claim 2 recites the limitation that a spin chuck comprising a mount part for mounting wafer and Konishi's tray section 30 mounts wafer. Additionally, Konishi discloses a spin coating apparatus (see column 5, lines 41-43 and Fig 6 developing unit having a spin chuck (2)).

In response to applicants' argument that Kelly and Chu do not disclose the extended projection part of the spin chuck has a height lower than that of the wafer mounted on the mount part, because in Kelly's the height of the elastomer must be substantially planer or the same as the height of the wafer. This is not persuasive because the elastomer in Kelly capable of having a height lower than the substrate, especially when deflated (see column 6, line 10-11). Furthermore, In Kelly the elastomer (41) is capable of being lower than the wafer of the substrate depending the thickness of the substrate treated and the amount of air of gas used to inflate the elastomer. although a height of elastomer that is substantially planar to the top of the substrate is taught in Kelly.

Finally, the devices disclosed by Konishi, Kelly and JP'029 alone and/or in combination with other meet applicant's claimed apparatus wherein the projection part

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of the spin chuck of each references (see above) capable of having a height lower than that of the wafer mounted on the mount part depending the thickness or size of the substrate. It is noted that a spin coating system positively comprising, among others, a wafer mounted on the mount part of the spin chuck, wherein the extended projection part of the spin chuck having a height lower than that of the wafer mounted on the mount part is not the claimed feature that is distinguished over the cited art.

As discussed in the phone interview the 08/02/07, the appeal Brief filed on 06/08/2007 of this application is withdrawn in view of applicants' acceptance to examiner's proposal indicating claim 11 allowable. Yet, upon further consideration, claim 11 was also found to be rejectable over reference to JP 2-137029 (IDS filed 06/06/2007) as indicated on the phone interview with John Bird on 08/06/2007.

Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 06/06/2007 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yewebdar T. Tadesse whose telephone number is (571) 272-1238. The examiner can normally be reached on Monday-Friday 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tucker Phillip can be reached on (571) 272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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